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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/760,389 | 01/21/2004 | Kunishige Oe | Q79276 | 1311 |
| 65565 | 7590 | 01/30/2007 | | |
| SUGHRUE-265550 | | | EXAMINER | |
| 2100 PENNSYLVANIA AVE. NW | | | SANDERS, JANIS C | |
| WASHINGTON, DC 20037-3213 | | | | |
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| | | | 1732 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
| 3 MONTHS | | 01/30/2007 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|-------------------------------|---------------------------|--|
| Office Action Summary | Application No. 10/760,389 | Applicant(s) OE ET AL. | |
| | Examiner Janis Sanders | Art Unit 1732 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>1/21/2004</u> , <u>7/14/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Applicant is advised that should claim 2 be found allowable, claim 10 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al in view of Fujii et al.

Yoshimura et al. (US 5,854,868) teaches a process for integrating optical devices and optical waveguides which comprises: first mounting one or more optical devices on a substrate, and then forming a refractive index distribution

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pattern and/or waveguide pattern on said substrate, by the steps of coating a material for forming said refractive index distribution pattern and/or waveguide pattern on said substrate and then patterning the material to form said refractive index distribution pattern and/or waveguide pattern, to form an optical coupling path communicating with said one or more optical devices (column 6, lines 2-11).

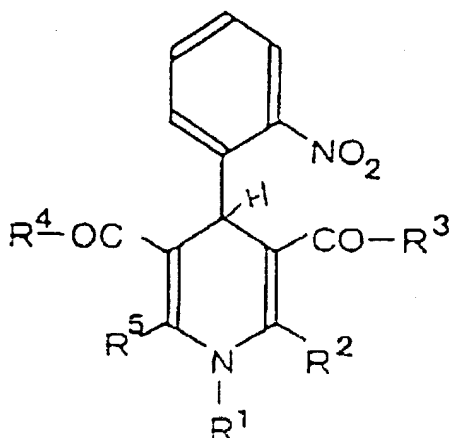
A process for integrating optical devices and optical waveguides which comprises forming a split refractive index distribution pattern and/or waveguide sections to form a waveguide pattern on a substrate after mounting an optical device on the substrate, with spacing formed at the boundaries of the split refractive index distribution pattern and/or waveguide sections to form the waveguide pattern, after which a photosensitive substance made of a material in which the refractive index or solubility is changed by light exposure, such as a photo-refractive index material or light curing material is applied to the regions which include said spacing, and light of a wavelength to which said photosensitive substance is sensitive is emitted from either or both the refractive index distribution pattern and or optical waveguide pattern to form an optical coupling bath (column 6, lines 46-60). Finally, after formation of the waveguide by RIE, the resist is peeled off, and the buffer layer is coated (column 2, lines 49-51). The reference further discusses that a waveguide may be formed using a highly transparent, highly heat-resistant polymer such as a fluorinated polyimide, or quartz or another glass or polymer material (column 3, lines 45-47).

Yoshimura teaches of a method of making a waveguide and using light to separate the photosensitive substance from substrate (resin). However, the

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reference does not teach of the chemical structures of the resin or photosensitive substance that comprise to make the waveguide.

Fujii et al (US 6,300,037) teaches the photosensitive polyimide resin, which contains 1,4-dihydropyridine derivative, is represented by the following general formula:



wherein R¹ to R⁵ each independently is a hydrogen atom or an organic group having 1 to 4 carbon atoms (column 3, lines 46-63).

Examples of the above photosensitizer include 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine, 1,2,6-trimethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine, 2,6-dimethyl-3,5-diacetyl-4-(2-nitrophenyl)-1,4-dihydropyridine, and 1-carboxyethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine. These may be used alone or in combination of two or more thereof. Especially preferred of these is 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine or 1,2,6-

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trimethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine (column 3-4, lines 66-67 and 1-9).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Yoshimura to include a resin chemical composition comprising of: a resin and 1,4-dihydropyridine, as taught by Fuji et al (US 6,300,037).

Yoshimura et al. suggests the use of a photosensitive polyimide resin (column 4, lines 52-56). Fuji et al. provides a specific example of such a resin thereby providing one of ordinary skill with motivation to make the substitution. Yoshimura, as modified by Fujii, further does not teach of the resin composition containing 0.1 to 30 parts by weight of 1,4-dihydropyridine derivative per 100 parts by weight of the resin.

However, one of ordinary skill would recognize that the effectiveness of the resin composition would depend upon its chemical composition and the amount of the photosensitive derivative. One of ordinary skill would have been motivated to do so to optimize the resin composition for an effective waveguide substrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that when the general condition of a claim is disclosed in the prior art, discovering the optimal or workable ranges involves only routine skill in the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Makabe et al. (US 6,607,865), Omote et al. (US 5,665,523), Ido et al. (US 6,671,438), Fujii et al. (US 6,591,491), Yamaoka et al. (5,053,314), Teramoto et al (US 6,654,535) disclose a method of making a waveguide and/ or photosensitive substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis Sanders whose telephone number is 571-272-7145. The examiner can normally be reached on M-F from 7-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Janis Sanders
Patent Examiner
Art Unit 1732

af
CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER
1/8/07